

The "Office Action Summary" mailed with the May 20, 2002 Office Action indicated that a "Notice of Draftpersons Patent Drawing Review (PTO-948)" was attached and that the Examiner objected to the drawings filed on 7 June 2001. Since neither a PTO-948 nor information regarding the grounds for objecting to the drawings was found with the subject Office Action, Applicant requests either more information or removal of the objections.

The USPTO asserted a 35 USC 101 statutory double patenting rejection against claims 21-40 based on United States Patent 6,281,055. With all respect to the Examiner, the 35 USC 101 rejections of claims 21-34 and 39-40 are traversed (claims 35-38 are cancelled).

Independent claims 1 and 10 of United States Patent 6,281,055 include specific limitations not found in the pending claims. For example, the Examiner's attention is directed to the thickness limitations of the gate insulation layer and of the active layer, and to the implantation energy limitations in the claims of United States Patent 6,281,055. Additionally, some of the pending claims include specific limitations not found in the claims of United States Patent 6,281,055. For example, the Examiner's attention is directed to the specific steps of forming the gate metal layer and the gate insulation layer (claim 21). Therefore, Applicants request the Examiner to remove the 35 USC 101 rejections of claims 21-34 and claims 39-40.

The USPTO also rejected claims 31 and 32 under 35 USC 112 as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors at the time the application was filed has possession of the claimed invention. This is because claims 31 and 32 recite, "The hydrogen ions heat the temporarily excited region to a temperature between about 200-300 degrees Celsius." The USPTO indicated that the specification only describes optimal doping temperatures as 200-300 degrees Celsius and not hydrogen ions as heating any region. With all respect to the Examiner, the 35 USC 112 rejections are traversed.

Direct support for the claim limitations found in claims 31 and 32 can be found in the subject application on page 6, lines 1-26, and more specifically on lines 7-26. A discussion of using implanted hydrogen ions to heat a regions, optimally to the 200-300 degree temperature range, is provided in a manner that would be understood by those skilled in the art.

The USPTO also rejected claims 21-40 under 35 USC 103(a) as being unpatentable over Yamaguchi et al. (United States Patent 5,897,346). With all respect to the Examiner, the Applicant traverses the rejections of claims 21-34 and of claims 39-40.

With respect to claims 21 and 39, the subject Office Action states that Yamaguchi et al. teaches a method of fabricating a TFT including the steps of: depositing a gate insulating material and a gate metal layer on an active layer, forming a gate, a gate insulating layer and an exposed portion of the active layer by etching the gate metal layer and the gate insulating material; and temporarily exciting a region by implanting H ions into the exposed portion of the active layer while using the gate as a mask. The USPTO indicated that while Yamaguchi et al. uses the active layer as a mask and implanting prior to the formation of the gate, that it would have been an obvious modification to alter the sequence of steps to implant the H after gate formation. Furthermore, the USPTO also asserted that as Applicants' claim uses the terminology "comprising" the claim includes the steps in any sequence. The USPTO cited *In re Burhaus* and *ex parte Rubin* for the law that "as a matter of fact selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results."

However, the Applicant directs the Examiner's attention to the specific language of claim 21: *--forming a gate,....* and *-- temporarily exciting a region of the active layer by implanting hydrogen ions into the exposed portion of the active layer while using the gate as a mask;....* [italics added]. Thus, the italicized language precludes performing the steps in random order or as disclosed in Yamaguchi. Claim 39 includes similar limitations.

Additionally, while Yamaguchi et al. teaches implanting H-ions after gate formation (see Fig. 3C, and text at column 5, lines 22-40), that implantation is performed to terminate “dangling bonds” in the active layer and the insulation layer. If an active layer is exposed, as in the subject invention as claimed, Yamaguchi et al. provides no motivation to perform H-ion implantation without a gate insulating layer, let alone when using the gate as a mask.

Thus, Yamaguchi et al. teaches fabricating thin-film transistors by forming a gate insulating film on an active layer, and then introducing hydrogen ions into the active layer through the gate insulating film (column 2, lines 20-28). Thus, Yamaguchi et al. does not disclose or suggest forming an excited region in an exposed active layer. In contrast, independent claims 21 and 39 recite a combination of features including “forming an excited region in an exposed portion of the active layer by implanting hydrogen ions.” Thus, claims 21 and 39 are allowable.

Moreover, it is unclear from Yamaguchi et al. whether an excited region is produced by the implanting hydrogen ions.

However, arguendo, even if an excited region is produced in Yamaguchi et al., such an excited region is apparently not used to form an impurity region while the excited region remains in the excited state, as recited in the present claims. The Examiner’s attention is directed to repeated teachings in Yamaguchi et al. to use laser annealing or some other technique to activate implanted ions (and thus form an impurity region). Reference column 8, lines 20-35; column 9, lines 34-44; column 10, lines 31-44; column 11, lines 7-12 and line 35; column 12, lines 1-7 (repairs damage); column 13, lines 45-67; column 14, line 59 through column 15, line 12; column 15, line 61 through column 16, line 9; column 17, lines 36-46; column 18, lines 39-47; column 19, lines 27-43; and column 20, lines 50-54.

In contrast, the pending claims of the subject application recite “forming an impurity region by heavily implanting impurity ions to said excited region while the excited region

remains in an excited state." Yamaguchi et al. does not teach or even suggest at least this feature of the present invention. Thus, again, claims 21 and 39 are allowable.

As claims 22-34 depend from allowable base claim 21, and as claim 40 depends from allowable base claim 39, those claims are also allowable.

Claims 35-38 are cancelled above. However, Applicant reserves the right to re-file those or similar claims, either in the subject application or in a subsequent application.

If the Examiner deems that a telephone call would further the prosecution of this application, the Examiner is invited to call the undersigned at (202) 496-7500. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

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